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BATS OF THE GENERA ANOURA
AND LONCHOGLOSSA

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In an effort to determine the exact status of *Lonchoglossa wiedi* Peters a study of *Anoura* and *Lonchoglossa* was undertaken. The results, while not so conclusive as might have been hoped, do serve to clear up some obscure points and help to simplify the nomenclature. Seventy-nine skins, ninety-four skulls, and eighty-six alcoholic specimens of *Anoura* have been examined and three skins, seven skulls, and ten alcoholic specimens of *Lonchoglossa*.

For the loan of material under their care, I wish to thank Gerrit S. Miller, Jr., of the United States National Museum, H. E. Anthony, of the American Museum of Natural History, G. M. Allen, of the Museum of Comparative Zoology, W. H. Burt, of the California Institute of Technology, and J. K. Doult, of the Carnegie Museum.

The members of the genus *Anoura* are most easily distinguished from *Lonchoglossa* by their larger size, forearms 40-47 mm. against 34.3-36.3 mm., and total length of skulls 24.5-27 mm., against 22.5-23.3 mm.

In *Anoura* there is no tail, the calcar is very short, almost rudimentary, and the base of the interfemoral membrane is very narrow. The interfemoral membrane is triangular in shape and well haired. In *Lonchoglossa* there is a short, imperfectly ossified tail, not discernible in most skins, and the base of the interfemoral membrane is relatively wide, to hold it. The calcar is well developed. The interfemoral membrane is semicircular in shape and much less hairy.

The skulls of the two genera are very similar in shape, but *Lonchoglossa* is smaller throughout and zygomata appear always to be present and well ossified. In *Anoura* the majority of skulls either do not have zygomata or they are but partly developed; in a very few they are well ossified.

The teeth present no separate characters except in size. The upper incisors show some variation in shape in both genera. The position of the upper premolars in *Anoura* is so variable that it can be no longer considered a generic character. In a series of seventy-seven skulls, the premolars in twenty are close against the base of the canines; in thirty-eight they are separated from the canines by a slight space; and in the other nineteen they are distant from the canines by a space at least equal to the length of the premolars at their bases.

The main characters by which the genera can be separated are summed up in the following key:

- Forearm 40–47 mm., total length of skull 24.5–27 mm. Tail absent; calcar rudimentary.....*Anoura*
 Forearm 34.3–36.3 mm., total length of skull 22.5–23.3 mm. Tail present; calcar developed.....*Lonchoglossa*

Anoura geoffroyi Gray is found in three geographic regions: (1) southern Mexico, Guatemala, and Salvador; (2) the Andes of Colombia, Ecuador, and Peru; (3) Trinidad, Venezuela, Brazil, and eastern Bolivia.

Numerous names have already been proposed for races from all of these regions but available material in this country is not adequate to characterize these forms fully except on geographic grounds and on average measurements. There are undoubtedly good color characters, but color in this species is so complicated by individual and seasonal variation that without series of skins from Mexico and Brazil the true color differences between the three regions can only be estimated. However, as specimens from these regions have received names, it seems best to allow at least three of them to stand until by the examination of more material a clearer understanding of the color characters is gained.

The type locality of *Anoura geoffroyi* is probably Rio de Janeiro, Brazil, but there are no skins from Brazil available. Material studied includes alcoholic specimens from Brazil, Bolivia, and Trinidad, and skins from Trinidad and Venezuela. Measurements show that these specimens average the smallest of those from the three regions: forearms 40–43 mm., skulls 24.7–25.5 mm. The skins from Trinidad, while dark, all have a decided reddish cast not found in specimens from the Andes and Mexico. The under parts also have a more brownish tone with less tendency to gray. The name for the specimens from this region is *Anoura geoffroyi geoffroyi* Gray.

Lonchoglossa wiedi Peters was separated mainly on account of its having zygomatic arches, but as this is a variable character of the genus *Anoura*, with which *wiedi* agrees in all other respects, the name becomes a synonym of *A. geoffroyi* Gray.

The greatest number of known specimens of the genus are from the Andean region. Material studied includes sixty-eight skins and sixty-three alcoholic specimens. These represent the largest form of the three regions: forearms 42–47.3 mm.; skulls 24.7–27 mm. In seventy-four out of 117 the forearms are over 44 mm. These specimens are also more blackish than those from Brazil or Mexico.

A series from Cuenca, Ecuador, taken July 12, averages slightly darker, both above and below, than a series from Loja, Ecuador, taken on October 30. The Cuenca series is fairly uniform but there is a great deal of variation in the series from Loja, especially in the under parts. In three specimens taken on the same day the bellies vary from dark gray to dark brown. The difference is not so marked on the backs although the one with the darkest belly also has the darkest back. The same individual variation is seen in the Colombian series but it is not known in what months the specimens were collected. The Peruvian specimens, which are in alcohol, are of the same large size as the more northern ones and apparently do not differ in color, so they may be considered to belong to the same form as the Ecuadorean and Colombian specimens.

The earliest name for specimens from the Andean region is *Choeronycteris peruana* Tschudi, which Thomas made a synonym of *Anoura geoffroyi*. The identity of specimens from Peru with those from Ecuador and Colombia will place *Glossophaga apolinari* Allen and *Anoura geoffroyi antricola* Anthony in the synonymy of this form, which may be known as *Anoura geoffroyi peruana* Tschudi.

The third region in which the genus is found is separated from the other two by nearly all of Central America. Material has been examined from Mexico (5 skins, 16 alc.) and Salvador (1 skin, 1 skull) and the genus has been reported from Guatemala. Specimens are intermediate in size between the other two forms: forearms 41–45 mm., skulls 24.5–26.1 mm. From the skins available, the color appears to be lighter, especially the under parts, which are almost a light gray. Two immatures have dark bellies which may be on account of age. The form from this region was described as *Glossonycteris lasiopyga* by Peters but was almost immediately put into the synonymy of *A. geoffroyi* by other authors. It should be known as *Anoura geoffroyi lasiopyga* Peters.

The genus *Lonchoglossa* contains two recognized conspecific forms and Thomas (Ann. Mag. Nat. Hist., (7), 8, p. 442, 1901) has suggested that Rengger's *Glossophaga villosa* is "perhaps a *Lonchoglossa* with the proportions of the upper incisors transposed."

Anoura geoffroyi geoffroyi Gray.

Anoura geoffroyi Gray, Mag. Zool. Bot., 2, p. 490, 1838—(Rio de Janeiro?) Brazil.

Glossonycteris geoffroyi Dobson, Cat. Chirop., Brit. Mus., p. 508, 1878.

Anura wiedi Peters, Monatsber. Akad. Wiss. Berlin, p. 398, 1869—Porto Seguro, Rio de Janeiro, Brazil.

Lonchoglossa wiedi Dobson, Cat. Chirop., Brit. Mus., p. 507, 1878.

Type locality.—(Rio de Janeiro?) Brazil.

Distribution.—Trinidad, Venezuela, Brazil, and eastern Bolivia.

Characters.—More brownish.

Measurements.—Forearm 40–43 mm., total length of skull 24.7–25.5 mm.

Specimens examined.—Total number 16. Trinidad: Caves of Aripo, 8 skins (A.M.N.H.); Port of Spain, 1 alc. (U.S.N.M.). Venezuela: Merida, 1 skin (A.M.N.H.). Brazil: Sao Paulo, 1 alc. (U.S.N.M.); Santa Catherina, 1 alc. (U.S.N.M.). Bolivia: San Matias, 4 alc. (1 F.M., 3 C.M.).

Anoura geoffroyi peruana Tschudi.

Glossophaga [*Choeronycteris*] *peruana* Tschudi, Fauna Peruana, 1, p. 71, 1844–46—Peru.

Anoura geoffroyi Thomas, Proc. Zool. Soc. Lond., p. 335, 1893.

Glossophaga apolinari Allen, J. A., Bull. Am. Mus. Nat. Hist., 35, p. 86, 1916—Boqueron de San Francisco, near Bogota, Colombia.

Anoura geoffroyi antricola Anthony, Am. Mus. Novit., No. 20, pp. 5–6, 1921—Loja, Ecuador.

Type locality.—Peru.

Distribution.—Andes of Peru, Ecuador, and Colombia.

Characters.—Larger and more blackish.

Measurements.—Forearm 42–47.3 mm., total length of skull 24.7–27 mm.

Specimens examined.—Total number 125. Peru: Ollantaytambo, 1 alc. (U.S.N.M.); Huancabamba, 1 alc. (M.C.Z.). Ecuador: Loja, 24 skins, inc. type of *antricola* (A.M.N.H.); Cuenca, 20 skins, 61 alc. (A.M.N.H.). Colombia: Bogota, 12 (10 M.C.Z., 1 A.M.N.H., 1 U.S.N.M.); Boqueron de San Francisco, near Bogota, 6 (1 U.S.

N.M., 5, inc. type of *apolinari*, A.M.N.H.); Paramo de Choachi, 1 (A.M.N.H.).

Anoura geoffroyi lasiopyga Peters.

Glossonycteris lasiopyga Peters, Monatsber. Akad. Wiss. Berlin, p. 365, 1868.

Type locality.—Southern Mexico.

Distribution.—Southern Mexico, Guatemala, and Salvador.

Characters.—Lighter in color; gray under parts.

Measurements.—Forearm 41–45 mm., total length of skull 24.5–26.1 mm.

Specimens examined.—Mexico: Vera Cruz, 1 skull only (U.S. N.M.); Texolo, V.C., 5 (1 F.M., 4 M.C.Z.); San Sebastian, Jalisco, 16 alc. (U.S.N.M.). Salvador: Mount Cacaguatigue, 1 dried mummy; Volcan Santa Ana, 1 skull only (Cal. Inst. Tech.).

Lonchoglossa caudifera caudifera Geoffroy.

Glossophaga caudifer Geoffroy, Mem. du Mus., 4, p. 418, 1818—Rio de Janeiro, Brazil.

Lonchoglossa caudifera Peters, Monatsber. Akad. Wiss. Berlin, p. 364, 1868.

Type locality.—Rio de Janeiro, Brazil.

Distribution.—Eastern and central Brazil.

Characters.—Dark brown, above and below.

Measurements.—Forearm 35–36.3 mm., total length of skull 23–23.3 mm.

Specimens examined.—Total number 11. Brazil: Rio de Janeiro, 4 alc. (1 F.M., 3 M.C.Z.); Sao Paulo, 1 skin and skull, 3 alc. (U.S. N.M.); Amazonas, Camanoas, upper Rio Negro, 3 alc. (U.S.N.M.).

Records.—Santa Anna de Chapada, Matto Grosso, Brazil (Thomas, Proc. Zool. Soc. Lond., p. 234, 1903).

Lonchoglossa caudifera aequatoris Lönnberg.

Lonchoglossa wiedi aequatoris Lönnberg, Arkiv f. Zool., 14, No. 4, p. 65, 1921.

Type locality.—Illambo, Gualea, Ecuador.

Distribution.—Ecuador.

Characters.—Much darker than true *caudifera*.

Measurements.—Forearm 34.3–35.9 mm., total length of skull 22.5 mm.

Specimens examined.—Total number 2. Ecuador: Illambo, 1 skin and skull (A.M.N.H.); "western Ecuador," 1 skin only (A.M. N.H.).

Remarks.—This form, so far as indicated by present material, is darker and slightly smaller than true *caudifera*.